

Claims

1. A process for producing a multilayer sheet S by
coating an optionally pretreated carrier sheet
5 with

1. a pigmented basecoat film,

2. if desired, a second pigmented basecoat film,
10 and

3. a clearcoat film

characterized in that

15 a. a pigmented basecoat material is applied to the
carrier sheet to give a wet basecoat film 1a,
which is adjusted to a residual volatiles
content of $x < 10\%$ by weight, based on the
20 basecoat film, to give a conditioned basecoat
film 1b,

25 b. the assembly comprising carrier sheet and
conditioned basecoat film 1b is adjusted to a
temperature of $< 50^{\circ}\text{C}$ on the surface of the
basecoat film 1b,

c. if desired, a second pigmented basecoat

material, or the same pigmented basecoat material for the second time, is applied to the conditioned and temperature-adjusted basecoat film 1b to give a wet basecoat film 2a, which is adjusted to a residual volatiles content of $y < 10\%$ by weight, based on the basecoat film, to give a conditioned basecoat film 2b,

d. if appropriate, the assembly comprising carrier sheet and conditioned basecoat films 1b and 2b is adjusted to a temperature of $< 50^{\circ}\text{C}$ at the surface of the basecoat film 2b,

e. a clearcoat material is applied to the conditioned and temperature-adjusted basecoat film 1b or 2b to give a wet clearcoat film 3a, which is adjusted to a residual volatiles content of $z < 5\%$ by weight, based on the clearcoat film, to give a conditioned, deformable clearcoat film 3b which is curable thermally and/or with actinic radiation.

2. The process as claimed in claim 1, characterized in that the residual volatiles content in steps a., c. and/or e. is adjusted by heating and/or convection.

3. The process as claimed in claim 1 or 2,

characterized in that in step a.

5 - in the first drying section an average drying rate of 10 to 40% by weight/min is employed, based on the total volatiles content of the applied basecoat film, until a residual volatiles content of $x = 12$ to 30% by weight, based on the basecoat film, is reached, and

10 - in the last drying section an average drying rate of 1 to 6% by weight/min is employed, based on the total volatiles content of the applied basecoat film, until a residual volatiles content of $x < 10\%$ by weight, more
15 preferably $< 7\%$ by weight, in particular $< 5\%$ by weight, based in each case on the basecoat film, is reached.

4. The process as claimed in any one of claims 1
20 to 3, characterized in that the basecoat film 1b in step b. is adjusted to a temperature $< 35^{\circ}\text{C}$ at its surface.

5. The process as claimed in any one of claims 1
25 to 4, characterized in that in step c.

- in the first drying section an average drying rate of 10 to 40% by weight/min is employed,

based on the total volatiles content of the applied basecoat film, until a residual volatiles content of $y = 12$ to 30% by weight, based on the basecoat film, is reached, and

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- in the last drying section an average drying rate of 1.5 to 4% by weight/min is employed, based on the total volatiles content of the applied basecoat film, until a residual volatiles content of $x < 10\%$ by weight, more preferably $< 7\%$ by weight, in particular $< 5\%$ by weight, based in each case on the basecoat film, is reached.

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15 6. The process as claimed in either of claims 1 and 5, characterized in that the basecoat film 2b in step d. is adjusted to a temperature $< 35^{\circ}\text{C}$ at its surface 2b.

20 7. The process as claimed in any one of claims 1 to 6, characterized in that in step e.

- in the first drying section an average drying rate of 10 to 30% by weight/min is employed, based on the total volatiles content of the applied clearcoat film, until a residual volatiles content of $z = 10$ to 15% by weight, based on the clearcoat film, is reached, and

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- in the last drying section an average drying rate of 0.5 to 3% by weight/min is employed, based on the total volatiles content of the applied clearcoat film, until a residual volatiles content of $z < 7\%$ by weight, more preferably $< 5\%$ by weight, in particular $< 3\%$ by weight, based in each case on the clearcoat film, is reached.

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8. The process as claimed in any one of claims 1 to 7, characterized in that the assembly comprising basecoat film 1b, if appropriate basecoat film 2b, and clearcoat film 3b is adjusted in a step f. to a temperature $< 50^{\circ}\text{C}$ at the surface of the clearcoat film 3b.

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9. The process as claimed in any one of claims 1 to 8, characterized in that the surface of the clearcoat film 3b in a step g. is covered with a protective sheet.

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10. The process as claimed in any one of claims 1 to 9, characterized in that the basecoat material in step a. is applied by means of a continuous method.

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11. The process as claimed in any one of claims 1

to 10, characterized in that the basecoat material in step c. is applied by means of a continuous method.

5 12. The process as claimed in any one of claims 1 to 11, characterized in that the clearcoat material in step e. is applied by means of a continuous method.

10 13. The process as claimed in any one of claims 1 to 12, characterized in that the basecoat material in step a. is applied by means of a directed application method.

15 14. The process as claimed in any one of claims 1 to 13, characterized in that the basecoat material in step c. is applied by means of an undirected application method.

20 15. The process as claimed in any one of claims 1 to 14, characterized in that the free side of the carrier sheet has been covered with an adhesion coat.

25 16. The use of the multilayer sheets S produced by the process as claimed in any one of claims 1 to 15 for producing color and/or effect films.

17. The use as claimed in claim 16, characterized in that the color and/or effect films serve for the coating of substrates.

5 18. The use as claimed in claim 16 or 17, characterized in that after they have been joined with the substrates the multilayer sheets S are converted by thermal curing and/or curing with actinic radiation into color and/or effect
10 coatings.

19. The use as claimed in claim 18, characterized in that the multilayer sheets S are stretched before, during or after their joining to the substrates.

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20. The use as claimed in any one of claims 17 to 19, characterized in that the substrates are automobile bodies and modules and exterior mounted components therefor.